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09/263338



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I, LEANNE MYNOTT, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 2063 for a patent by IMR WORLDWIDE PTY LTD. filed on 06 August 1999.



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LEANNE MYNOTT  
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ORIGINAL

PROVISIONAL SPECIFICATION

NETWORK USER MEASUREMENT SYSTEM AND METHOD

The invention is described in the following statement:

## **NETWORK USER MEASUREMENT SYSTEM AND METHOD**

### **TECHNICAL FIELD**

This invention relates to a system and method for measuring and/or analysing usage of resources on a network or the like. More particularly, the  
5 invention relates to measuring and/or analysing usage of Internet site resources. In this context, the Internet is a global network formed by the interconnection of thousands of sub-networks that all make use the same protocols and address structure.

### **BACKGROUND ART**

10 In light of high penetration of Internet use and rapid growth of on-line industry, there has become a need for a relatively accurate and independent Internet site ratings service. Such a service should provide Internet site publishers and advertisers alike with a precise vehicle with which to assess vital Internet site traffic dynamics. For example, it would be advantageous for site  
15 publishers and advertisers to have an accurate picture of the information Internet users were viewing on particular Internet sites, as well as the range of sites their target markets were visiting, the advertisements being viewed and how particular sites compared statistically with competitors sites. This type of commercial information is invaluable to those in the on-line industry wishing to  
20 properly target their markets and also focus their on-line presence.

One known measurement method is that of server log file analysis. In this method, a log file is kept on a server of all record files requested, IP addresses of those visiting the site as well as successful downloading of files delivered from the site server. This method, however, is not necessarily an accurate  
25 indication of the resources used and/or viewed on the site, due to the method not being able to account for files that are subsequently stored in proxy server caches or browser caches and are re-viewed. For example, popular web pages may be stored on various Internet Service Providers' (ISPs) proxy servers around the world, so that the ISPs do not need to directly access a popular site  
30 every time a user requests access to that site: the ISP simply provides access to their stored version of the site. This enables the ISPs to provide a more efficient

service, but not necessarily a more accurate one due to this inability to monitor caches.

Similarly, once a site is accessed, site resources are saved in the user's browser cache, while in use. While the server log file analysis may have  
5 recorded data relating to the accessed files at the time they were accessed, if the user then returns to one or more pages, such as by hitting the "back" button on their browser, then the file being returned to is typically accessed from their browser cache, so that once again this page request is not recorded by the server log file.

10 Another method used by some market research organisations is the so-called browser based measurement approach. In this method, software monitors site resources as they are viewed within a browser. This software monitors the user's actions when accessing the Internet. While this approach does not suffer the accuracy problems of server log file analysis, a problem that  
15 does exist with this approach is that for a complete market analysis, all sites need to be willing to agree to install the HTML measurement code on every site page. In practice it has proven quite difficult to obtain cooperation with all sites.

In another method, also used by some market research organisations, Internet users are recruited and their individual usage of the Internet is  
20 monitored to be used in statistical analysis. Usage is monitored by installing hardware and/or software on the user's computer. This hardware/software is not transparent for the user and is often quite onerous, requiring the user to log the software on each time they use it, and also affecting the speed of their Internet access adversely.

25 An example of this method is provided in US Patent No. 5,675,510, where personal computer use is measured through the use of hardware "box" physically located on the user's computer. This hardware records log files of Internet access by the user. This process is expensive due to the hardware costs, installation costs as well as maintenance and support costs. Furthermore,  
30 the process is quite obtrusive, as the users are very conscious of the tracking as they see the box every time they use their PC.

There is considered to be a need for an alternative measurement

approach that provides accurate results and also has improved transparency for the user.

Another problem with this hardware/software approach is that the recruitment process is onerous, requiring the research organisation to recontact  
5 respondents once they have initially agreed to take part in the survey. This approach is time consuming, costly, and generally has a high drop off rate with respondents often being less willing to take part in the survey at a later date.

There is also considered to be a need for a more efficient recruitment process.

10 An object of the present invention is to alleviate at least one prior art problem.

### **SUMMARY OF INVENTION**

According to a first embodiment of the invention, there is provided a network enabling Internet access by a user computer, characterised in that a  
15 connection means on the user computer may be set to enable connection between a research server and the user computer such that the research server is communicably coupled between the connection means on the user terminal and an Internet site server in order to monitor the Internet usage of the user.

In this regard, the expression "connection means" is taken to refer to the  
20 means by which a user is provided with Internet access, such as an Internet browser. Additionally, the user computer may be any means capable of receiving and displaying information from the Internet, such as an set-top Internet terminal.

According to a further embodiment of the invention, there is provided a  
25 method of enabling Internet based market research in a network having at least one user computer with an Internet browser, the method including the step of altering a proxy setting of the Internet browser to divert the user computer's Internet access through a market research server.

Therefore, by making a small change to the setting of a user's connection  
30 means / network browser at only one point in time, it is possible to analyse the user's network usage, without the need for installing any software, impacting on user time or diverting their attention. This method also is able to take into

account usage of resources stored in caches.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

An illustrative embodiment of the present invention will now be described with reference to the accompanying figures, in which:

5        Figure 1 illustrates a flow chart of the recruitment process according to a preferred embodiment of the invention; and

Figure 2 illustrates a flow chart of the on-going tracking process according to a preferred embodiment of the invention.

## **DETAILED DESCRIPTION**

10        According to a preferred embodiment of the invention, there is provided a system and method for measuring usage of web sites on the Internet. This usage is measured at least partially by recruiting a representative sample of Internet users to form a "panel". Reliable statistics on Internet population data collected off-line is used to determine preset demographic quotas for the  
15 recruitment process. For example, in Australia, the Australian Bureau of Statistics (ABS) provides reliable Internet population incidence data. It is considered that a minimum panel size of 2000 active users is necessary and that these users should be demographically representative of the preset quotas, according to such criteria as age, sex and income. Another factor that could  
20 also be taken into account is whether they are a business user or a private user.

The recruiting process according to a first embodiment of the present invention involves soliciting potential panellists when they are using or "surfing" the Internet. With reference to Figure 1, a pop-up survey is used which randomly samples every Xth user who visits the page containing the survey (1).  
25 This soliciting is facilitated via paid advertising allotments over perhaps hundreds of randomly selected sites so as to capture a broad cross-section of users. As an alternative to the pop-up survey, banner advertising may be used.

It is to be appreciated that this pop-up survey is preferably able to identify whether the user is already a panellist. For example, the program may check to  
30 see if the user has a unique cookie used by all panellists. If such a cookie is present, then the pop-up survey is not served on the user.

If the user is not already a panellist, however, the pop-up survey may be



served on the potential respondent. Initially the user is asked whether they would be interested in participating in an ongoing Internet usage study in exchange for free gifts or other remuneration (2). The user may either accept or decline.

- 5        If the user accepts, they are then presented with a survey which asks the respondent standard demographic questions (3).

The responses to these initial demographic questions will determine eligibility to join the panel. In other words, if a respondent falls within the preset  
10    quota, then he or she will be offered the chance to be part of the panel. Incentives are chosen with consideration in order to minimise the impact on panellist behaviour and cost structures, whilst on the other hand promoting panel continuity.

- 15        Successful respondents who agree to become a panel member are asked to implement a set up process (4).

This recruitment process has many advantages over existing methods, particularly in that it is able to be performed on the spot without the need for re-contacting the user to implement the set up procedure. Additionally, it is simpler than existing methods, and also more cost efficient.

- 20        In the embodiment of the set up process shown in Figure 1, the user is instructed to change his or her browser setting (4) to access the Internet via a proxy server, which in this case is the research organisation's measurement server. If the user has trouble in effecting this set up, they may e-mail a helpdesk provided by the research organisation or access a call centre via telephone.

- 25        A central data source, which may be on the measurement server, also obtains and records full personal details of each panellist (5). The measurement organisation is then able to contact the panellist at any time in the future (6), for reasons such as ensuring that the panellist's personal details are still correct or confirming that they still wish to be a panellist.

- 30        As an alternative to the manual set up process (4), a software program may be used to effect the browser setting change: for example, the user could click on a link, and the link would then implement the change.

Examples of the manual set up process will now be described with reference to some existing Internet browsers.

If the user has Internet Explorer 4.0, to divert their Internet access through a measurement server, they would be required to select "Internet Options" from their "View" menu, then "Connection Folder", followed by "Access the Internet Using a Proxy Server". In the address entry box, they would enter the address of the measurement server, which would be provided to them by the research organisation.

Alternatively, if the user had Netscape 4.0, they would be required to select "Preferences" in the "Edit" menu of their browser, followed by "Advanced", "Proxies", Manual Proxy Configuration" and "View". In the http: entry box they would then be required to enter the address of the measurement server, as provided by the party initiating the network measurement.

This proxy is invisible to the user and enables the research organisation to monitor the Internet usage of the panel member without the need for downloading software onto the user's computer. The transparent proxy also does not impact regular viewing activities to any notable degree and so is relatively unobtrusive, unlike existing hardware and software methods. Another important advantage of the transparency of this tracking technique is that it promotes panel continuity.

With reference to Figure 2, once a user has agreed to become a panel member (7), on each consecutive time (8) that the user requests access to the Internet using their network browser, this request is diverted (9) to the research organisation's measurement server (14), by virtue of the proxy setting of the browser. The measurement server's proxy (15) then implements the access request by forwarding the request to the requested Internet site server.

When the access request is diverted to the measurement server (14), the panel member is able to be identified by virtue of a unique cookie placed on their computer during the sign up process. A cookie is a feature of the Internet protocol HyperText Transport Protocol (HTTP), which is essentially a unique identifier stored on the user's computer.

This identification of the user may be made each time the user sends a

request to view a particular resource or Internet site. Alternatively, the identification of the user may only be made when the initial access request is made: that is, when the user initially attempts to "log on".

Once the measurement server has received a request for access to a particular Internet site or HTTP server, and has identified the user, the request is forwarded to the relevant Internet web server to implement the request. The web server then passes the requested resource back to the measurement or proxy server. The measurement server in turn passes the file to the user's browser together with proprietary code. In Figure 2, the proprietary code is added via the "WebMeter" component (10) of the measurement server.

The measurement server may only use a particular proprietary code, such as Java. When Java is supported, the embedded code or program may be used to trigger the download of a Java applet from the measurement server. However, it is more preferable that the measurement server utilises in-house developed programming code which facilitates the appropriate use of various programming languages, such as Java, Java script and CGI.

Therefore, in this context, the embedded program is a mini-program that runs on the user's operating system, and which is capable of measuring usage of the pages of the Internet site accessed. For example, it is able to record the URL of the page being measured as well as the time spent on that page. In the event that the user selects a hyperlink or enters a new URL (Uniform Resource Locator), then the program is stopped temporarily before restarting again, once the new page relating to the hyperlink/new URL is obtained from the web server of the visited page, via the measurement server.

It is to be noted that not all requests made by the user will be sent to the Internet site server via the measurement server for obtaining the requested network resource or HTTP server page. This is because the user's network browser may store some previously downloaded resources in a browser cache. Therefore, on subsequent requests, these cached pages may be provided directly to the user, rather than again obtaining the requested page through the measurement server itself. These subsequent requests are still able to be measured by the present technique, as those pages would initially have been

provided through the measurement server, and thus already include the code that will be reactivated when requested from a cache.

It is to be further appreciated that this program is preferably only run after the entire HTML page has been read from the HTTP server, so that its timing is  
5 accurate. Also, the overhead on the user when running this program is negligible.

When the program is running, it channels data continuously to the measurement server. Alternatively, the data may be channelled to another server remote from the measurement server. The channelled data may be  
10 spooled (11) and/or sent directly to another server or database for analysis (12). This analysis may be performed on the measurement server or remotely.

As shown in Figure 2, the measurement server (14) may also include a user management section (13) which monitors and manages all user requests. For example, this section may check for any untoward usage of sites (eg one  
15 user visiting a particular site fifty times in one day), that may not be representative of the overall sample of panellists. If the user management section finds anomalies like this, the particular data may then be disregarded by the research organisation. Additionally, ongoing sample management by the management section (13) could account for attrition rate and growth in Internet  
20 usage.

When a panel of users are all providing their usage data to the measurement server an accurate view of Internet usage by the "panel population" is able to be obtained. The data obtained via this "panel" approach may be used in isolation to obtain relevant statistics. Alternatively, a fusion of the  
25 panel data with data obtained via census/browser based measurement may be used. In this alternative way, it is possible to fill the reporting gaps of commercial sites for which accurate census/browser based data is not available, in order to improve the overall market measurement accuracy.

The user details should be periodically validated, so from time to time the  
30 user's should be contacted to confirm participation and verify personal details.

Variations and additions are possible within the general inventive concept as will be apparent to those skilled in the art. In particular, if a user's

operating system does not support Java, alternative approaches for obtaining measurement data are possible and within the inventive concept, such as via CGI (Common Gateway Interface) measurement.

Additionally, the invention should not be limited to the Internet, as it is  
5 applicable to any network where usage of various resources needs to be monitored.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of enabling Internet based market research in a network having at least one user computer with an Internet browser, the method including the step of:  
altering a proxy setting of the browser to divert the user computer's Internet access through a measurement server.
2. The method of claim 1 further including the step of :  
upon receiving an Internet access request at the measurement server from a user's browser, identifying the user via a cookie.
3. The method of claim 2 further including the step of :  
upon receiving an Internet resource requested by the user from a visited Internet site, passing the resource to the user's browser with embedded code which will trigger the download of an applet from the measurement server; and  
monitoring the usage of the resource using the applet.
4. The method of claim 3 further including the step of :  
passing monitoring data produced by the applet to the market research server.
5. The method of claim 4 further including the step of:  
using data produced by a plurality of applets passed to at least one user in collating market research data.
6. A network enabling Internet access by a user computer, characterised in that a connection means on the user computer may be set to enable connection between a measurement server and the user computer such that the measurement server is communicably coupled between the connection means on the user computer and an Internet site server in order to monitor the Internet usage of the user.

7. The network of claim 6 wherein the connection means is an Internet browser.

8. An apparatus for measuring usage of Internet resources, including:  
a research server in communicable relation with a user browser, the communicable relation effected via a proxy setting of the browser;  
such that the user browser is capable of accessing at least one Internet resource via the research server, and the research server is capable of initiating usage measurement of the resource accessed.

9. The apparatus of claim 8 further including a measurement means that is passed with an accessed resource from the research server to the user browser for measurement of the usage of that resource on the user browser.

10. The apparatus of claim 9 wherein the measurement means is a Java applet.

11. The apparatus according to claim 9 or 10 further including a database for spooling usage data from the measurement means.

12. The apparatus according to claim 11 wherein the mini-server is located on the research server.

13. The apparatus according to any one of claims 9 to 12 further including an identification means such that when the user first requests access to an Internet resource, data is posted to the research server, which notes the user identification.

14. The apparatus of claim 13 wherein the identification means is a cookie.

15. A method of measuring usage of Internet resources, including the steps of:

enabling a user's browser proxy setting to reference the location of a research server;

receiving an Internet resource request at the research server from the user's browser;

forwarding the access request to an access provider to obtain the requested resource;

receiving the requested resource at the research server from the access provider;

passing the requested resource to the user's browser together with a measurement means to monitor the usage of the requested resource.

16. The method of claim 15 further including the step of identifying the user at the research server via an identification means sent with the resource request.

17. The method of claim 16 wherein the identification means is a cookie.

18. The method of claim 15 wherein the measurement means utilises embedded code present in an HTML page.

19. The method of claim 15 wherein the access provider is an Internet Service Provider.

20. A method of recruiting a network user to participate in a network usage measurement scheme, including the steps of:

ascertaining whether the user is a suitable participant;

ascertaining whether a suitable participant is willing to participate in the network usage measurement scheme;

upon ascertaining a willing participant, immediately altering a proxy setting of the willing participant's network browser, to divert the participant's



network access through a measurement server.

21. The method of claim 20 wherein an introductory questionnaire is presented to the user in order to ascertain whether the user is a suitable participant.

22. The method of claim 21 further including the steps of:  
determining whether the user is an existing participant of the measurement scheme; and  
presenting the user with the introductory questionnaire only when the user is not an existing participant.

DATED this 6th day of August 1999

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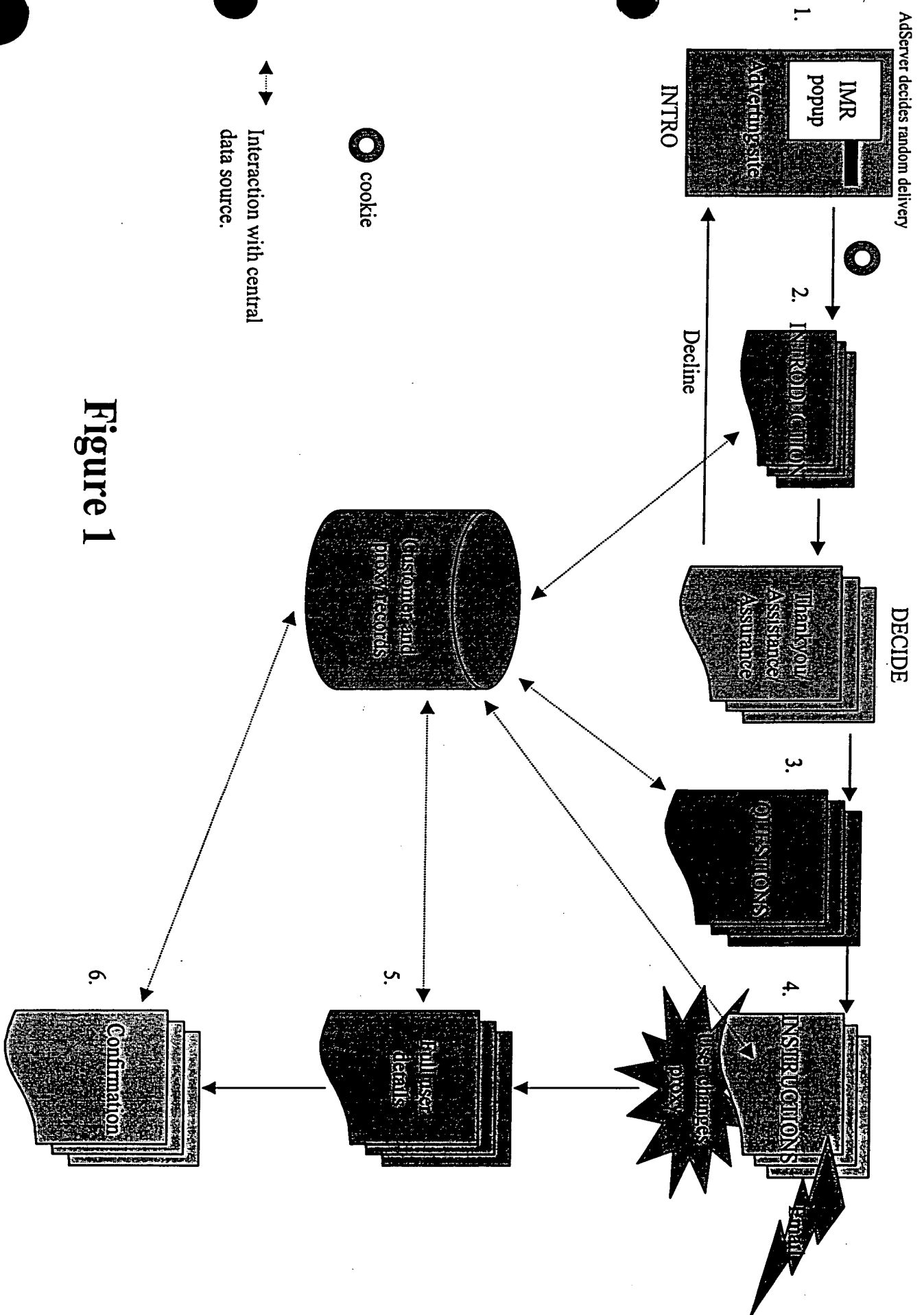
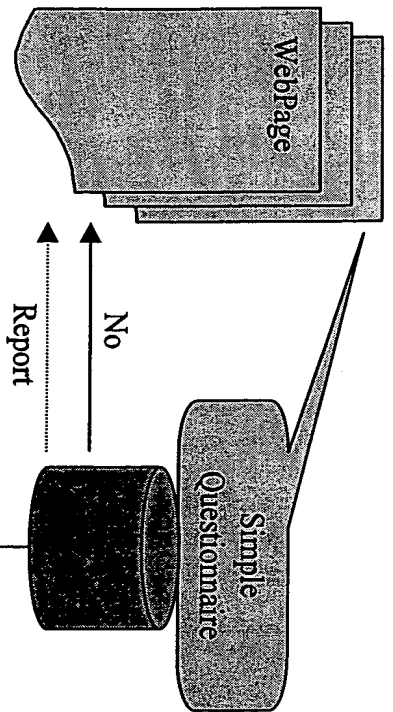


Figure 1

## 7. Initial Capture



## 8. Consecutive Use

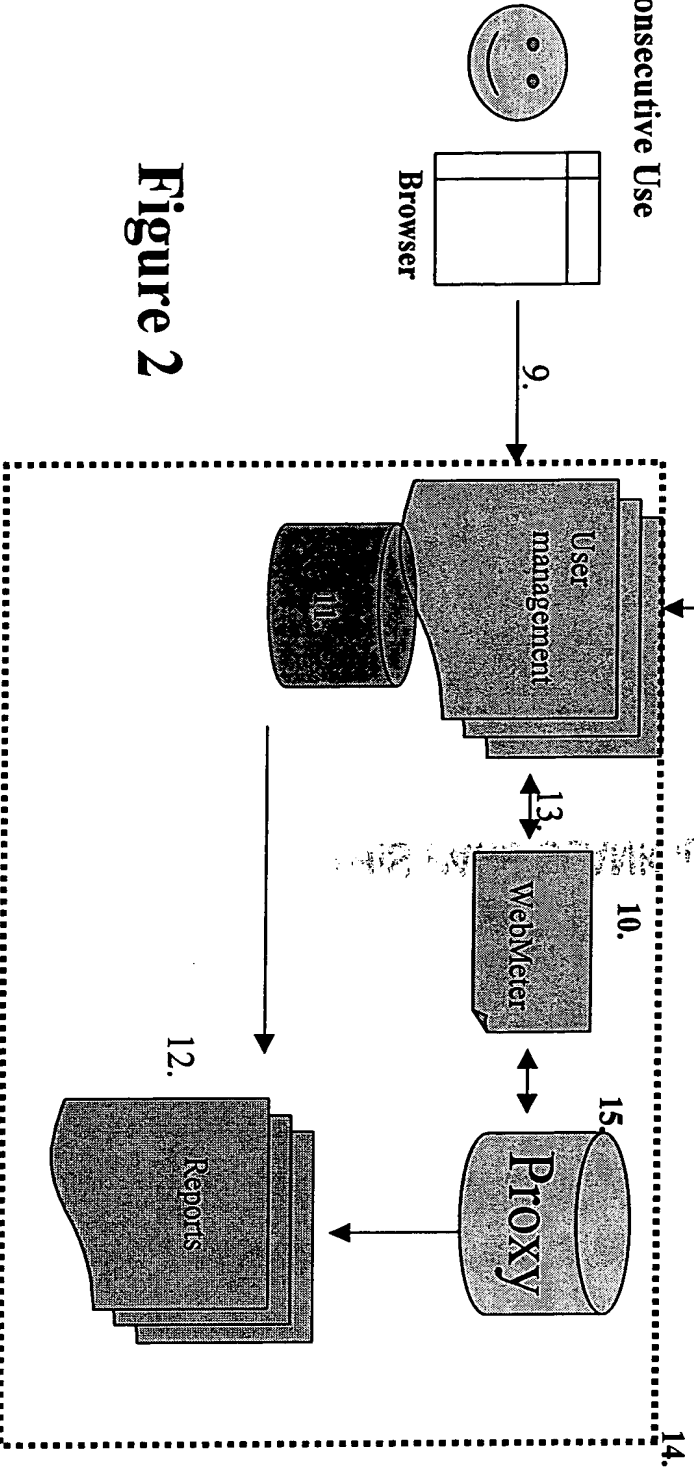


Figure 2

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